Zero Retries issue 0110 2023-08-04

Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0110

Request To Send

Editorial by Steve Stroh N8GNJ

Administrivia - Substack's Growing Pains

Substack, the platform I use to publish Zero Retries seems to be going through the "awkward teenager" part of its life cycle, as evidenced by a huge growth spurt. Substack has grown to define the new(ish)1 category of paid subscription email newsletters. Substack has enabled many authors to rise to prominence, that simply wasn't possible on other platforms such as blogs, "news sites", and especially social media services that are advertiser supported.

But accompanying that growth spurt are scaling problems at Substack such as significant bugs that ~~go unfixed~~ take some time to fix, tech support requests that go unacknowledged, and most recently, subscribers that aren't getting all their Zero Retries emails every week. Apologies on all of that - I think we're just going to have to wait it out; Zero Retries isn't in the same league for attention from Substack as Letters from an American or Sinocism.

As I've said, Substack supported Zero Retries for nearly two years at no cost to me and some (albeit minor) cost to them as Zero Retries' subscriber base grew. Now that a number of subscribers have decided to convert to paid subscriptions (***Thank you very much, paid subscribers!***), it would be disruptive to change platforms. That said, it seems prudent for me to look at other services that have emerged now that Substack has proven out this market. When / if I pull the trigger for other newsletters, for diversity of vendors, I'll probably do so on Ghost.2

My First Editorship - North Coast ARC Communicator

On my SuperPacket blog I tell the story of my first experience at editing a newsletter, the North Coast Amateur Radio Club's Communicator - My First Editorship - North Coast (Amateur Radio Club) Communicator Newsletter.

***More* Unobtainium On Its Way to DLARC - Digital Digest**

In addition to Packet Radio Magazine and the North Coast Communicator, another "unobtainium" publication that was in my collection and is now on its way to Digital Library of Amateur Radio & Communications (DLARC) for digitizing and public access are seventeen issues of **Digital Digest** - *Devoted entirely to Digital Amateur Radio Communications*, that was published by Tom Arvo WA8DXD beginning in 1988.

Digital Di

Vol. 1 No. 1 *Devoted entirely to Digital Amateur Radio Communic*

In This Issue:

The DIGIPEATER . . .
features news and information on a new satellite tracking program, packet software and more...

PACKET . . .
Lynn Taylor, WB6UUT gets down to basics of packet operation with a packet primer...

Norman Sternberg, W2JUP gives some worthwhile advice on how to be more successful on HF packet and avoid some headaches

Craig Rader, N4PLK discusses Digicom>64, low cost packet hardware and software for Commodore 64 and 128 owners

AMTOR . . .
Paul Newland, AD7I discusses the applications and how-to's of APLink...

BITS & BYTES . . .
Lacy McCall, AC4X gives his insights on and perspectives of Net-Rom and more...

RTTY/CW . . .
Jonathan Mayo, KR3T looks at the various popular digital modes of amateur communication, including equipment required and operation...

MPUTERS . . .
athan Mayo, KR3T
s a basic review on micro-puters in the ham shack.
cal systems, setup and opera-

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The purpose of this publication is to be an au
favorite modes of digital communications. Within
on Packet, AMTOR, RTTY, Satellites, Computer
as possible to you, we encourage your input.
CompuServe I.D.# 73330,1335. Let us know wha
more of, or haven't been able to get. We'll liste

Your comments, suggestions... and yes, even cri
in communications, and the better we commu
become. We've taken what we believe to be a fi
literary support from some of amateur radio
including: Norman Sternberg, W2JUP; Lynn Ta
McCall, AC4X; Paul Newland, AD7I; Dr. Gary G
W1BEL; Andy Funk, KB7UV; Don Deem, KB4LL
their knowledge in this and/or future issues of

With our first issue, we felt it might be fitting to
the more popular modes of digital commun
advanced topics on an operational and techn
Digest to be considered "the source" for obtain
the growing spectrum of amateur digital comm

My qualifications for publishing Digital Digest
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enjoyed being a ham for the past 27 years and
thus far in computer and communications tech
with the idea, enthusiasm and inherent amate

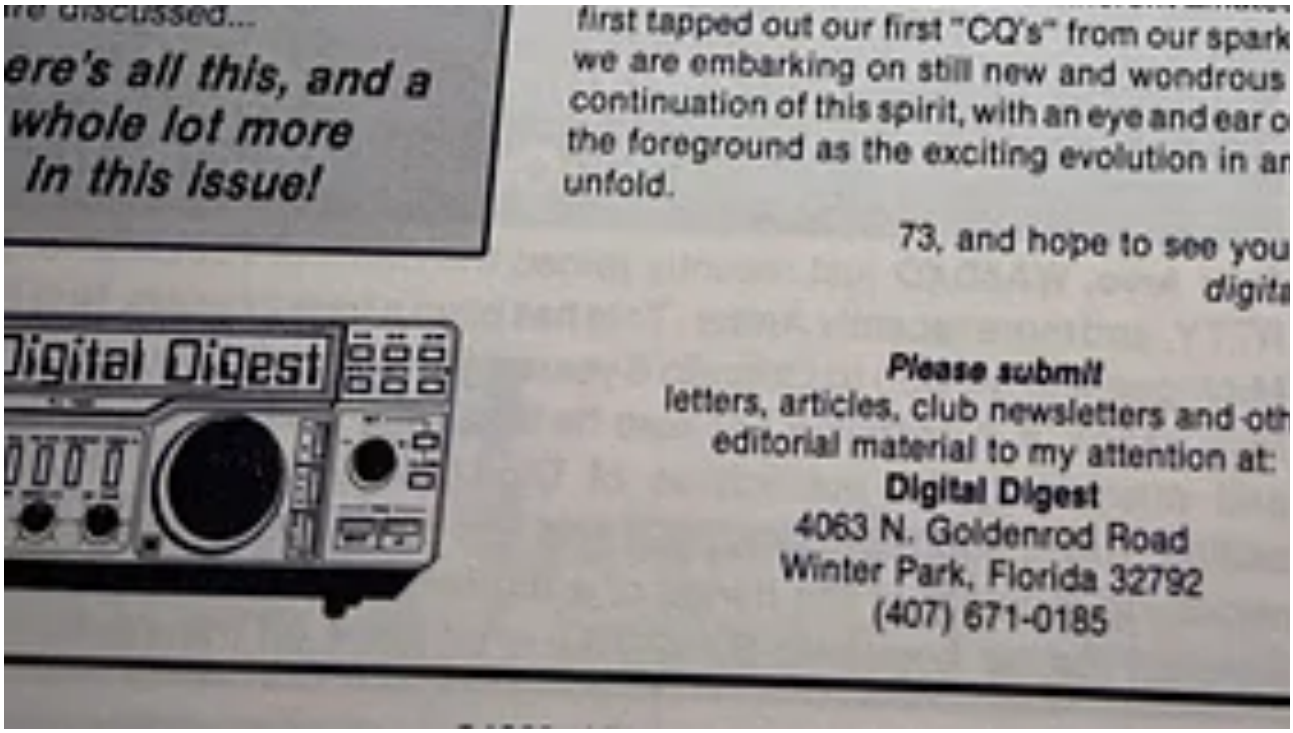
ere's all this, and a
whole lot more
in this issue!
first tapped out our first "CQ's" from our spark
we are embarking on still new and wondrous
continuation of this spirit, with an eye and ear c
the foreground as the exciting evolution in ar
unfold.
73, and hope to see you
digita
Digital Digest
Please submit
letters, articles, club newsletters and oth
editorial material to my attention at:
Digital Digest
4063 N. Goldenrod Road
Winter Park, Florida 32792
(407) 671-0185

Image by Steve Stroh N8GNJ - personal collection

Digital Digest probably influenced my vision for Zero Retries, though I'd long forgotten about it - *it's been ~35 years*. DD was bimonthly, and the first issue was 20 pages, printed on 11x17 paper, folded and stapled into a newsletter. What was impressive was that (unlike Zero Retries), WA8DXD was able to persuade many different writers to contribute to DD on varied aspects of data communications3 in Amateur Radio. Most of all WA8DXD was able to attract *advertisers* to help support DD.

Like Packet Radio Magazine, I seem to have (had…) the only surviving copies of Digital Digest. I've only seen passing mentions of DD, but no one else seems to have posted scanned copies online.

As I've sent more such material to DLARC, I'm alternately bummed that we don't have nearly as many varied publications such as Digital Digest in Amateur Radio any more, and excited that finally these varied specialized publications will be all in one place and publicly accessible. I hope that they stimulate some ideas for technological innovation in Amateur Radio - especially better data communications systems that we imagined back in the day, but didn't have the technology (or technology that was cost effective) to implement grand ideas at the time, *but we do now*. One example is a prescient publication called Spread Spectrum Scene4 - first published in 1992. *Now* we have cheap compute, cheap Digital Signal Processing, and cheap Software Defined Transceivers that now we *can, cost-effectively* implement Spread Spectrum.

Computer Shopper Digitization Project

(*Not* Amateur Radio)

As I work through my collection of Amateur Radio media and package it and send it to DLARC, I saw mention of this *epic* project to digitize *all* of the entire run of Computer Shopper Magazine. This is another herculean archival project by Jason Scott, "Free Range Archivist" with Internet Archive.

If you're too young to remember CS, it's the most absurd example (that I know of) of the bygone era of paper magazines delivered to your home via USPS postal mail. Every month, the behemoth CS arrived in the mailbox - barely. (I cannot imagine what abuse must have occurred to copies that were sent to apartment buildings.) CS was huge both in page *size* (tabloid) and page *count*. CS weighed about a pound per issue, and it *kept* coming *every* month. One commenter said:

> During my tenure, I think the single largest issue we published was around 920 pp.

As for my history with Computer Shopper, I was always fascinated when I got my copy in the mail and it took days to just flip through marveling at the infinite variety of PC clones. Ultimately, when I had to reduce my magazine collection during my move out of my original home office, one of the easiest decisions was to jettison my collection of CS. In doing so my issues of CS literally *overflowed* the big recycle bin tote.

Decades later, I found a handful of copies of CS in good condition at a surplus electronics store, and will keep them in my collection… just because if you merely describe CS to someone who's never seen an issue, they just won't believe you - they need to *see* (and hold) one.

While I look forward to all of CS to be available in Internet Archive (there is one proof of concept available now), reading the story of what Scott and colleagues are going to go through get CS digitized - melting the glued spines to separate pages, special modified scanner, manually feeding single pages, correcting color and margins, etc. for the very poor paper quality and printing, etc. is a reminder that as much as we enjoy digitized content… in the end *someone has to do the hard work of doing the digitizing*. That's why I try to put a nice note in each box I ship to DLARC.

I have a *very* small part to play in the Computer Shopper digitizing story. I happened to have the May 1996 issue of CS, which wasn't part of the collection that began this project. I've shipped it to Scott, with my gratitude for him being willing to tackle this huge project. When I see that issue appear online, I'll feel the same pride that I feel about my contributions to DLARC.

Where is the *Leadership* for an Amateur Radio Payload in Geosynchronous Orbit for the Western Hemisphere?

By Steve Stroh N8GNJ

*Asking the question… why **aren't** we talking, agitating, planning, promoting the idea of an Amateur Radio payload in GEO for the Western hemisphere?*

Up front - yes, this article is, in no small measure, partly out of envy of Amateur Radio Operators in the Eastern hemisphere who have had their Amateur Radio payload at GEO - QO-100 for five years now.

*In this article, I excerpt some non-public information obtained from AMSAT Journal issues that are only accessible "behind the paywall". My brief excerpts are intended to be **fair use**, not wholesale republishing of "must be a member to access" content.*

Part of the fun of doing something like Zero Retries is being able to ask a question in hopes of starting a conversation about a topic that is of intense interest to me, but seems to be widely ignored.

I've written a number of times in Zero Retries about the *hope* of putting up an Amateur Radio payload onto a satellite in geosynchronous orbit (GEO) above the Western hemisphere. Click here and search for GEO5. But to date, nothing I've written has elicited any substantive response despite having reached out numerous times to a prominent promoter of the idea.

The logical place to look for leadership on such a project is AMSAT-NA. The most recent *public* mention I can find about the possibility of a GEO payload for the Western hemisphere is in the January / February 2022 Apogee View by Robert Bankston KE4AL, President of AMSAT-NA:

> **GEO Rideshare**
>
> By all appearances, an amateur radio-only satellite will not earn us a ticket into a geostationary orbit. The only way we see getting there is as a payload aboard a commercial communications satellite. QO-100 (Es'hail 2) proved it was possible. As such, we will be forming a task force to search out rideshare opportunities over North America. Cold calling and begging for a ride has not worked. We need a team of "insiders" to not only open the door for us, but get us in front of the decision makers. If you work in the industry or know the right person, we could certainly use your help.

Now that I'm a member of AMSAT, I can browse the AMSAT Journal behind the paywall. (Admittedly as a new member, I'm way behind on reading AMSAT Journal.)

In the May / June 2022 AMSAT Journal Apogee View column, KE4AL reiterated the above:

> I am often asked, "When will AMSAT put a satellite in geostationary orbit?" The short answer is NEVER,... if we have to do it ourselves. The Federal Communications (FCC) is not going to allow a bunch of weekend warriors to play in geostationary orbit; not to mention, the price of admission, continued operation, and indemnification is beyond our reach. So, our best opportunity is to partner with someone already going there as a secondary payload.
>
> No one has knocked on our door offering a free ride, nor have we succeeded in our numerous cold call attempts. We need someone on the inside or even a friend of a friend, who can get us in the room. If you know someone and an opportunity, I could use your help.

Part of the problem with AMSAT-NA not currently being involved in attempting a GEO payload might be explained by this excerpt from **AMSAT-NA's Strategic Plan 2021 - 2035** published in the January - February 2023 AMSAT Journal:

> **Strategic Satellite Objectives and Organization Goals**
>
> **Highly Elliptical Orbits**
>
> Upward to HEO. Develop and deploy a series of spacecraft capable of providing wide-area and continuous coverage from high-Earth and geostationary transfer orbits.

Note - geostationary *transfer* orbit - basically a non-stationary (from a point on Earth) *elliptical* orbit - but *not* geostationary.

I scanned / keyword searched the Strategic Plan, but that was the *only* reference I found to GEO.

And… *that's all*, having scanned all the AMSAT Journals from 2022 and 2023 to date. Most disheartening is that I find only the *initial mention* of "task force to search out rideshare opportunities over North America". Since then, no mention of this task force, thus it may never actually have been formed.

In fairness, AMSAT-NA is a small organization with ~4,000 members and ~$950k in financial reserves.

I mean no disrespect to AMSAT-NA, or its past or current officers and board, but given that there doesn't seem to be any focus on a GEO payload for the Western Hemisphere… perhaps it's appropriate to consider forming a new organization whose *sole focus* is to get an Amateur Radio payload into GEO orbit for the Western hemisphere?

I understand that there might be some consternation about this idea… splitting resources, dividing loyalties, duplicative organizations, etc. But if there's no current focus on GEO within AMSAT-NA… how much "harm" could a new organization do?

You might ask "why does an Amateur Radio GEO payload for the Western hemisphere *matter so much*? Speaking for myself, working a GEO payload is technically challenging and more technical *interesting*. As explained well in the previous attempt for a Western hemisphere GEO payload, such a payload would use a 5 GHz uplink, and a 10 GHz downlink - dynamic channels, ample bandwidth, *entirely digital*. Yes it would be challenging to build such an Amateur Radio station, but once you get it dialed in, your experimentation shifts to the digital / data realm as users have been doing on QO-100. *Most of the new, techie Amateur Radio Operators want to experiment with data modes!* Note the two relevant Amateur Radio / satellite activities at the upcoming DEFCON conference - Making Hackers into Hams below, and the excitement at attempting to hack a satellite (that was specifically launched for the purpose).

Open Research Institute

I would be remiss if I didn't acknowledge the work being done by Open Research Institute on a GEO payload and a GEO ground station:

- Phase 4 Ground Station – Digital microwave broadband communications system for space and terrestrial amateur radio use. Relies on an open source version of DVB-S2/X and polyphase filter banks. FDMA uplink at 5GHz and TDM downlink at 10GHz.
- Haifuraiya – High Flyer – Digital microwave broadband communications system for space. 6U, GEO and interplanetary. Relies on an open source version of DVB-S2/X and polyphase filter banks. FDMA uplink at 5GHz and TDM downlink at 10GHz. FPGA board, TT&C, and RF board design are all in progress.

ORI's work, as far as I can tell, is solely conceptual and hardware development of the payload… nothing (again, that I can tell) about getting said payload *into orbit*.

So… if it (apparently) won't be ARRL, or AMSAT-NA, ORI, TAPR, or ARDC (though they may help fund it) or any other organization that *is* focused on getting an Amateur Radio payload into GEO above the Western hemisphere… than *who*?

Having surveyed "the usual suspects", I come back around to the idea that maybe *it is time* to form something like Amateur Radio GEO Association (AmGEO).

Leave a comment

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Resurrected Heathkit Still… Alive…

By Steve Stroh N8GNJ

The resurrected Heathkit is still alive, and has come out of the shadows a bit.

There were hints as early as 2013 that the venerable Heath Company (corporate name now Heathkit) was being resurrected. From my perspective, Heathkit's resurrection in the mid 2010s was an irritating years-long tease and I quickly grew tired of the company's secrecy, lack of explanations or transparency, continuous teasers such as an anonymous Reddit Ask Me Anything (AMA), etc.

At that time, I had more faith in placing an order with Alibaba than "Resurrected Heathkit". As I recall, my prediction at the time was that "Resurrected Heathkit" was some kind of a shell game or maybe just an ego play that would eventually fizzle out.

Well, it's now a decade later, and "Resurrected Heathkit" is still alive and offering some products such as an upscale AM radio receiver kit (solder and no-solder options) and most recently, the Most Reliable Clock.

But oddities persist…

- The last product info in the News section was from *2015*.
- The primary email address for "Resurrected Heathkit" remains their original "keep it mysterious" email address - *info.2015@2015.heath.company*.
- The page for "Gold Certified Pre-Owned" is nothing more than the eBay page for "datapro" and includes items from MFJ that have nothing to do with Heathkit.
- The extensive links bar on the left are mostly blank pages such as the entry for Robotics.
- Checking out the Vintage Manuals link (I searched for HW-2036) eventually directs you to an unrelated website to make payment - https://sc4.vom.com/d8/index.fwx?C=MANUALS.

The resulting impression of all those oddities suggests more of a loose confederation of individuals with "side hustles" rather than a single company.

But, credit where due - "Resurrected Heathkit" is no longer quite as deep in the shadows as it was a decade ago. The company seems to be headquartered in Santa Cruz, California with a facility in Ottsville, Pennsylvania. And, finally, there is a *name* associated with "Resurrected Heathkit" - President Andrew Cromarty - N6JLJ.

The strongest legacy of Heathkit is the stellar experience of building a Heathkit - products designed from the beginning *to be built by amateurs*, great documentation - step-by-step instructions and explanation of theory of operation, products easy to test and calibrate upon completion, and support in case you screw up. That legacy of example lives on in kit products such as the NinoTNC and Elecraft products that are designed from the beginning, like Heathkit products, to be built by amateurs.

As for whether Heathkit *has come back*, you'll have to draw your own conclusions.

Leave a comment

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Amateur Radio *Used* to Have Two Organizations Representing Data Operating

By Steve Stroh N8GNJ

Would a current day American Digital Radio Society (ADRS) and / or International Digital Radio Association (ADRS) be able to represent data operating in Amateur Radio?

In packaging up my material in the latest two boxes to be shipped off to Digital Library of Amateur Radio & Communications, of course my gaze lingers

on the first page of anything I send off to DLARC. I came across many mentions of **American Digital Radio Society (ADRS)** and **International Digital Radio Association (ADRS)**. Both organizations seem to have just "coasted to a stop". I finally found *a good explanation for "the split" of the two organizations* thanks to DLARC's excellent indexing of the various publications involved in the two organizations - ADRS Board Split On Mission - IDRA Formed.

I don't bring this up to rehash old organizational history. Rather, I'm briefly imagining *what might now be different if one or both of these organizations had continued*? Especially now with the current kerfluffles of trying to get symbol / baud rate restrictions eliminated in US Amateur Radio, and to have another authoritative voice on behalf of US Amateur Radio in regard to the "Shortwave Modernization Coalition" petition.

What was unique about ADRS and IDRA is that they were organized to represent those who were *operating* data modes in Amateur Radio - mostly, Radio Teletype [RTTY] on Amateur Radio High Frequency (HF) bands. But, had they continued, I would guess that they would have modernized their respective charters to embrace other data modes and VHF / UHF operations. While ARRL at one point helped represent data mode operations such as Packet Radio, as did TAPR, but neither organization had, as their focus, *operating* data modes that ADRS and IDRA had.

It's probably just fantasizing on my part to imagine resurrecting ADRS (and / or IDRA) to *focus on promoting data operating in Amateur Radio*. This idea arises out of frustration that ARRL keeps focusing on promoting rules modernization *only for HF operations*, and TAPR, which was formed to promote data communications in Amateur Radio, has long ceased being involved in regulatory reform. Those of us who believe that data modes are *the* future of Amateur Radio need to build a better option that those two organizations to represent data operating, and maybe the examples of ADRS and IDRA might help form such a new organization.

Leave a comment

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

41st Annual AMSAT Space Symposium and Annual General Meeting

> The 41st Annual AMSAT Space Symposium and Annual General Meeting will be held on Friday through Saturday, October 20-21, 2023, in Irving, Texas.

Making Hackers Into Hams

Dan Romanchik KB6NU will be teaching a one-day class at DEFCON 31 (2023) for the attendees to learn enough to pass the test for their Technician Amateur Radio license.

> In this class, KB6NU will cover everything you need to know to pass the Technician Class license exam. The text we'll be using is KB6NU's No No Nonsense Technician Class License Study Guide, which is available for free from KB6NU's website - https://www.kb6nu.com/study-guides/.

I think this is just… *cool*! Kudos to KB6NU and those who organized this class and testing.

FT8 Dominates VHF Contests

Bob Witte K0NR observes that data modes such as FT8 are starting to be… *more common*… than analog (human) modes in contesting.

> The FT8 operators tended to stay on FT8, even when the signals were strong. If they wanted to maximize their score, they probably should have switched over to SSB to make contacts at a faster rate. But they didn't and that is their choice. (One thing I've come to accept is that I don't control the choices that other radio hams make in terms of operating mode and band.) On 6 meters, I made 428 contacts with 80% of them on FT8. Radio operator decisions affect the types of QSOs made and if I focused only on SSB, I would surely have had more SSB contacts (but how many?)

I think the trend K0NR is observing will only accelerate. It's my observation that a lot of folks are quite comfortable letting the computer do the work of managing the contacts and the noise floor is steadily increasing in populated areas, which data modes can just power through.

Fox Hunting with the KrakenSDR

In my opinion, the KrakenSDR is a game changing Software Defined Receiver whose capabilities have yet to be fully exploited. The RTL-SDR blog provides some context in introducing a YouTube video from Mark Jessop VK5QI.

> Over on his YouTube channel Mark Jessop has uploaded some dash cam footage showing him using a KrakenSDR and a custom LED display to hunt down three amateur radio transmitters during a fox-hunt.
>
> An amateur radio fox-hunt is an activity where someone will hide a transmitter within a defined area, and it is up to the hunters to use radio direction finding equipment to find it. The KrakenSDR is our 5-channel coherent radio based on RTL-SDRs, and it can be used for applications like radio direction finding.
>
> Mark uses a custom four element array on the roof of his car, which is connected to his KrakenSDR. Instead of the KrakenSDR app, Mark prefers to use his custom LED HUD to displays the bearings and signal power directly.

I was delighted to discover VK5QI's YouTube channel as it's yet another that looks promising for the Zero Retries Interesting list of YouTube channels with some eclectic content such as 115.2kbaud FSK Modem Test and… *Emu cleaning a BBQ*.

A Declaration of Love to Amateur Radio

Michael Clemens DK1MI wrote a moving tribute to his involvement and resulting love for Amateur Radio, including many Zero Retries Interesting aspects of Amateur Radio.

> With an amateur radio license one can build radios oneself, irradiate the moon with radio waves, communicate via satellites, chat with astronauts, flying pilots, engineers on oil tankers, researchers at Antarctica, compete with others, have a reason to go into nature, make friends worldwide, acquire and expand language skills, understand the world better, and find many ideas for various projects.
>
> …
>
> Since the spring of 2019, practically not a day has gone by that I have not engaged in some form of amateur radio.

DK1MI also has a Zero Retries Interesting blog (which I now subscribe to) and a Projects page with many interesting projects such as Building a LEO satellite ground station, Part I: 70cm Eggbeater Antenna.

Bad Hosts, or How I Learned to Stop Worrying and Love the Overlay Network

This article seems unrelated to Amateur Radio, but to me it was thought provoking about what *I* would love to see implemented with 44Net. The problem with experimenting with Amateur Radio TCP/IP services *on the Internet* is that the Internet has turned into a "bad neighborhood", as in *anything* you do that is directly on the Internet *will be attacked*. Thus it gets complicated *to even try* to do Amateur Radio experiments on the Internet, which kind of dilutes the value of 44Net. But Robin Sloan sums up that problem, and the solution, quite elegantly, with a possible raison d'être for 44Net.

> For years, I was vexed by the task of reliably reaching the two servers in my office from anywhere outside, e.g. from home. The office doesn't have any fancy network hardware, just a Wi-Fi router, and the best I could manage was a brittle port-forwarding scheme that never worked for more than a couple of months at a time.
>
> Then I discovered ZeroTier, which allows you to create and manage these overlay networks. I installed it on my laptop, my old iMac, and my two servers, as well as an EC2 instance, and ever since, I have hopped between them with ease, no matter where I am. Each computer has a stable IP address in the 10.0.0.0/8 range, reserved for private networks. It's fabulous. They are all hosts again.
>
> There's a similar service called Tailscale, along with Slack's somewhat more robotic Nebula, and plenty more to come, I'm sure.
>
> I am the only inhabitant of my ZeroTier network, and I get the sense a lot of people use the service this way, but both ZeroTier and Tailscale allow you to create overlay networks with many users — hundreds or more. In those cases, the networks become little mini-internets for your coworkers, your group of friends, your pirate armada, whatever.

Yeah! ***That's*** what I would love for 44Net to be! If I want to be part of a "overlay network" for, say, AREDN, just click that in my 44Net configuration and the system adds you to that network. Another example would be a small group of friends that like experimenting between themselves and want to give access to their Amateur Radio systems to friends with little friction.

ZeroTier is now on my very short list of things to study (briefly) and get using. I expect it to solve some major vexing issues for my systems just as it did for Sloan.

Fair Radio Sales Going Out of Business Sale

If you're into electronics, *at all*, and you're within driving distance of Lima, Ohio (Northwest corner of the state), you owe it to yourself to make one last pilgrimage to Fair Radio Sales - *pretty soon*.

> After being in the surplus electronic military business over 50 years, I have decided it's time to retire and close the business. Fair Radio Sales has over 30,000 sq ft of electronic parts and equipment that must go.
>
> Over the next several months plan your visit to Fair Radio to stock up on electronic parts, equipment, manuals, vacuum tubes and one of a kind items at lower than hamfest prices. Buy an item, a pallet, or a truckload. Come and make a deal. Cash and carry.

I remember poring over the Fair Radio Sales catalog as a teenager, imagining what you could do with all the cool stuff they advertised, like surplus radios from military tanks. I made such a pilgrimage a few years ago, showing up on a rainy weekday when I was the only customer and they let me wander the stacks of the warehouse. It took me *an hour* to just wander casually through the many, many racks of stuff that were at least twenty feet high. Thus my advice to *drive* - anything you buy at Fair Radio Sales isn't going to fit into checked baggage on an airline flight.

My thanks to Pseudostaffer Jeff Davis KE9V for yet another stellar Zero Retries Interesting discovery that I didn't spot.

M17 The Open Source Digital Mode For Ham Radio

Great overview video on the hardware aspects of M17 Project - Tech Minds YouTube.

My thanks to Ren Roderick KJ7B for alerting me to this video.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- **Founding Members who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Chris Osburn KD7DVD
  Founding Member 0002 - Don Rotolo N2IRZ
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org
- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-*

now for me!

- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~100~~ ~~200~~ ~~300~~ ~~400~~ *500* ~~600~~ ~~700~~ *800+* other readers:

Subscribe now

Please tell your co-conspirators about Zero Retries — just click:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA.

2023-08-04

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Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1

While there have been paid email newsletters as long as there's been commercial email, prior to Substack, one had to integrate subscription management, mass email system, payment, and customer service. Substack integrated *all of that* to offer a "write, click publish, we do the rest" *service* that lets us writers focus on the writing.

2

One major disappointment with Substack is that I've now verified that Substack is, effectively, one newsletter per account. If I want to set up another newsletter, even if related to Zero Retries, with a separate subscriber base… well, Substack just doesn't do that. So, for other newsletters, I might as well try out other platforms like Ghost.

3

Digital *voice*, which is now the more normal use of "digital" in Amateur Radio, was, in the late 1980s, barely a concept.

4

Somehow, I overlooked letting DLARC know about Spread Spectrum Scene for inclusion in DLARC - now corrected.

5

There's a reasonable argument to be made from readers that complex topics such as a GEO payload are getting hard to keep track of spanning more than one hundred issues of Zero Retries. *I'm working on that issue!* Very recently Substack fixed a major bug that was handicapping me in doing so.